1) $\pi: 3x+y-z-4=0$

a) $3(1)+3-z-4=0$
$3+3-z-4=0$
$6-z-4=0$
$-z+2=0$
$-z=-2\ (-1)$
$z=2$

b) $3(0)+y-z-4=0$
$y-z-4=0$
$y-6=0$
$y=6$

c) $3(k)+2-(k-1)-4=0$
$3k+2-k+1-4=0$
$2k-5=0$
$2k=5$
$k=\frac{5}{2}$

d) $3(2)+2(\text{cota})-z-4=0$
$6+2(\text{cota})-z-4=0$
$2(\text{cota})-z+2=0$
$z=2(\text{cota})+2$
P3 $(2, 2^{*}z)+2, 11)$

e) $\pi_0: 3x+y-z-4=0$
$\pi_1: kx-4y+4z-7=0$

$\frac{3}{k}=\frac{1}{-4}=\frac{-1}{4}$

$3(k=1(-4$
$3k=-4$
$k=\frac{-4}{3}$

FORON:

② $2x-3y-z+D=0$ $A(4,-2,1)$

$2(4)-3(-2)-1+D=0$
$8+6-1+D=0$
$13+D=0$
$D=-13$

$2x-3y-z-13=0$

③ $-3x-y+z+D=0$ $A(-1,2,3)$

$-3(-1)-2+3+D=0$
$3-2+3+D=0$
$4+D=0$
$D=-4$

$-3x-y+z-4=0$

④ $A(1,0,2)$, $B(-1,2,-1)$ e $C(1,1,-3)$

$\vec{AB}=(-2,2,-3)$
$\vec{AC}=(0,1,-3)$

$\vec{AB}\times\vec{AC}=(12,6,2)$

$12x+6y+2z+D=0$
$12(1)+6(0)+2(2)+D=0$
$12+0+4+D=0$
$16+D=0$
$D=-16$

$12x+6y+2z-16=0$

$\begin{cases} x=a \\ y=b \\ z=c \end{cases}$

⑤ $\vec{AB}=(1,1,5)$
$\vec{AC}=(-1,1,2)$

$\vec{AB}\times\vec{AC}=(1-1,1-5,1-1)$
$=(0,-4,0)$

$0x-4y+0z+D=0$
$0(0)-4(0)+0(0)+D=0$
$D=0$

$-4y=0$

FORON:

(9) $A(2,0,-1)$, $B(-2,6,3)$ e $C(0,3,4)$

$AC = (-2,3,5)$
$AB = (-4,6,4)$

$AB \times AC = (12, 12, -36)$

$12x + 12y - 36z + D = 0$
$12(2) + 12(0) - 36(-1) + D = 0$
$24 + 0 + 36 + D = 0$
$60 + D = 0$
$D = -60$

$12x + 12y - 36z - 60 = 0$

(13) $A(2,0,-2)$ $u = i - j + k$ e $V = 2i + 3j$

$u \times V = (3, -2, 4)$

$3x - 2y + 4z + D = 0$
$3(2) - 2(0) + 4(-2) + D = 0$
$6 - 0 - 8 + D = 0$
$D = 2$

$3x - 2y + 4z + 2 = 0$

(14) $A(-3,1,-2)$ e $B(-1,2,1)$ $r: \frac{x}{2} = \frac{z}{-3}, y = 4$

$n = B - A = (2,1,3)$

$2x + y + 3z + D = 0$
$2(-3) + 1 + 3(-2) + D = 0$
$-6 + 1 - 6 + D = 0$
$-11 + D = 0$
$D = 11$

$2x + y + 3z + 11 = 0$

(15) $A(1,-2,2)$ e $B(-3,1,-2)$ $\pi: 2x + y - z + D = 0$

$\overrightarrow{AB} = (-4,3,-4)$

$(2,1,-1) \times (-4,3,-4) = (-7,-6,-2)$

$-7x - 6y - 2z + D = 0$
$-7(1) - 6(-2) - 2(2) + D = 0$
$-7 + 12 - 4 + D = 0$
$D = -1$

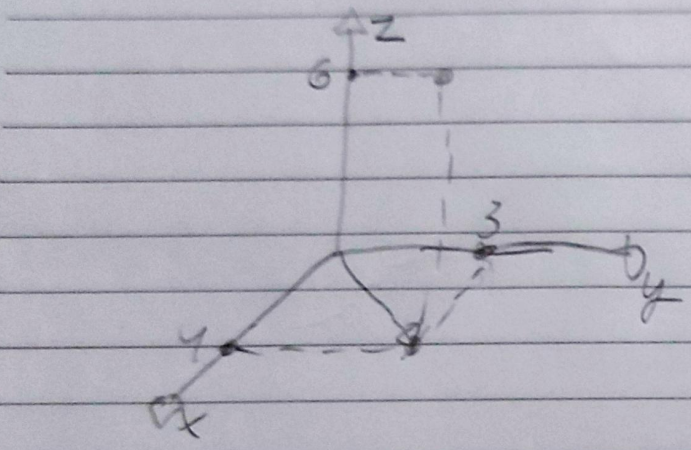
$-7x - 6y - 2z - 1 = 0$

51) a) $y=0$ $z=0$ $3x+0(0)-12=0$ $x=4$
$(4,0,0)$

$x=0$ e $y=0$ $0+0+2z-12=0$ $z=6$
$(0,0,6)$

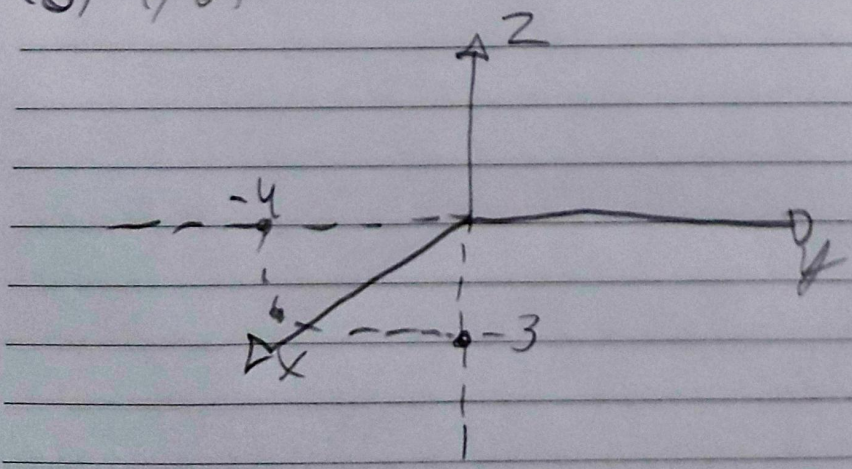
$x=0$ e $z=0$ $0+4y+0-12=0$ $y=3$
$(0,3,0)$

$(4,0,0)$, $(0,0,6)$ e $(0,3,0)$



e) $3y+4z+12=0$ $z=0$
$3y+4(0)+12=0$ $y=-4$
$(0,-4,0)$

$y=0$ $3(0)+4z+12=0$
$z=-3$ $(0,0,-3)$



$z=0$ $3y+4(0)+12=0$
$y=-4$ $(0,-4,0)$